Recall of women in a cervical cytology screening programme
An estimate of the true rate of response

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There have been studies of the response-rate of women to invitations to have a first cervical smear (for example: Saunders and Snaith, 1969), but a truer measure of how well smears are accepted as a routine health precaution—the rate of response to invitations to have a repeat smear—has received little attention apart from the report of a recent pilot study for the national recall scheme (Allman, Chamberlain, and Harman, 1974).

The organization and progress of the cervical screening programme in the Manchester region have been described in detail elsewhere (Wakefield, 1972). Briefly, letters of invitation to attend for repeat smears are generated by computer and sent to women three years after they have had a negative smear. However, some who receive the letters prove to be no longer eligible on medical grounds for recall, and not all the women receive the letters. The scheme is, therefore, subject to two types of error that derive from incomplete information: ineligible women may be invited because certain medical information cannot be fed routinely into the computer record; others are inaccessible to recall, usually because they have moved. Here we attempt to calculate a realistic rate of response to a letter of recall after taking such factors into account.

STUDY POPULATION

The study was based on the records of 1007 women whose first tests had been negative in May 1968 and who were ostensibly due for recall in May 1971. The records were originally abstracted for a study of factors that affect response to recall (Sansom et. al., 1975). There were 850 women still available for recall, of whom 405 had attended for a second smear, a crude response-rate of 47·6%. For one reason or another, 602 women had apparently not had a repeat test. It does not follow, however, that they had failed to respond to the recall letter, because effective recall may be regarded as having taken place only when a woman who is eligible for a further test receives a letter that invites her to be re-examined three years after her last negative smear. Using this definition, we evaluate the recall scheme and calculate an appropriate rate of response.

INTERIM USE OF THE SERVICE

In all, 150 of these women had had one or more subsequent cytotests since 1968 and were therefore not eligible for three-yearly recall in 1971. We have called them 'interim returners'. Some were following a medical regime which requires more frequent
smears than under the general screening programme. Women taking oral contraceptives, for example, are often examined annually, and smears are done routinely during ante- and post-natal examinations. Some women were recalled by the laboratory at shorter intervals in an experimental scheme to determine the optimum period between smears. Some would also, since their last normal smear, have developed gynaecological symptoms that called for another examination. And some women make interim use of the service because they want more frequent reassurance than is provided by the routine three-yearly recall. These 150 interim users reduced the original population of 1007 to 857 women who were apparently eligible for recall.

**Mortality**

Of the eligible women who had not come for a repeat smear, seven had died. From the age-structure of this population, the expected number of deaths, based on the Registrar General's *Statistical Review for the Year 1971*, would have been about 2.4 per annum, or slightly over seven during the three years before recall. The observed was therefore consistent with the expected number of deaths. The number of women eligible for recall was then 850.

**Ineligibility for Further Screening**

The most usual change in medical status that exempts women (according to their doctors) from further cervical smears is having had a hysterectomy. They are often advised that further tests are unnecessary, but it is only if the women themselves inform the regional screening laboratories that the computer record is modified.

Our data on this group are derived from interviews with a sample of 93 women drawn from the population of 850 ostensibly eligible for recall. Nine had had a hysterectomy in the intervening three years. This is similar to the estimate of Spriggs and Boddington (1970), in a study of recall in the Oxford area, that 10% of the women recalled had become ineligible for this reason. That the proportion should be high in a population of screened women is only to be expected, since the operation is most frequent in women between the ages of 35 and 50 (Fairbairn and Acheson, 1969), an age-group that accounts for 40% of the women screened in the Manchester region (Sansom, Wakefield, and Yule, 1970). Around 10% of the women due for recall are, therefore, likely to have become ineligible for further tests because they have had a hysterectomy. Others, not identified in our sample, may have changed their medical status in some other way, for example, by being under treatment for some other gynaecological disorder or by admission to a psychiatric hospital.

**Inaccessibility to Recall**

Inaccessibility to recall is usually the result of a change of address. Women either move outside the region served by this screening programme, or they move within the region but leave no forwarding address and do not receive the recall letter.

Of the 850 women recalled, we were able to identify 44 (5.2%) who had moved outside the Manchester region. In the recent study by Allman *et al.* (1974) extensive checking was carried out before the recall letters were sent out. Even so, 4.4% of the 970 women recalled were found to have moved out of the areas under study.

According to the *Sample Census 1966: Migration Regional Report*, movement out of the south east Lancashire and north east Cheshire region to other parts of Great Britain occurred at the rate of 2% for the year immediately preceding the census (1965–66) and 6.2% for the preceding five years (1961–66). These figures suggest that the rate of migration out of this region is increasing, and our rate of 5.2% for the three years 1968–71 seems conservative.

Information about movement within the region is more difficult to secure, because only registration with a new doctor calls for an obligatory change in National Health Service records. However, 71 had moved within the region according to the laboratory records, and a further 28 were identified by the Central Health Services Register.

Further unrecorded changes came to light when we tried to organize interviews with a sample of the women. Of 183 women, 48 had moved and left no forwarding address: two of these had emigrated, and 11 houses had been demolished under the re-housing programme. No information about the current address was available for the rest. Changes of address as a result of slum clearance and re-housing are of particular interest, as they are likely to affect women in the social classes most at risk of cervical cancer.

The 1966 sample census showed that the rate of migration within the region for the preceding year (1965–66) had been 8.1%, and for the preceding five years (1961–66) 26.4%. Adding the rates for migration inside and outside the region, the totals are 10.1% for the year before the census and 32.6% for the five years before. Taking all known instances of changes of address for our population of 850 women, 191 (22.5%) had moved in the three years since they were first examined, which is well within
Recall of women in a cervical cytology screening programme

TABLE

<table>
<thead>
<tr>
<th>Movement</th>
<th>No. of Women</th>
<th>Proportion of Sample (n = 850)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of region</td>
<td>44</td>
<td>5.2</td>
</tr>
<tr>
<td>Inside region, new address</td>
<td>71</td>
<td>8.4</td>
</tr>
<tr>
<td>Inside region, new address</td>
<td>28</td>
<td>3.3</td>
</tr>
<tr>
<td>No information on current</td>
<td>48</td>
<td>5.6</td>
</tr>
<tr>
<td>address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total who had moved</td>
<td>191</td>
<td>22.5</td>
</tr>
</tbody>
</table>

the range expected from the census figures. From the summary of mobility rates in the Table, we therefore estimate that, in any three-year period, about 5% of the previously screened population will move out of the region and become inaccessible to recall, and about 9% will be temporarily inaccessible because they have moved, but their change of address has not yet got into the computer record.

ADMINISTRATIVE PROBLEMS

Finally, certain administrative factors artificially depress the rate of response to recall. Not all the agencies that take smears in this region are linked to a single record-keeping body, and some local laboratories where smears are read keep separate records, so that women who respond to the letter but go to an agency outside the scheme appear in the regional computer records as non-returners. We uncovered 19 such cases, and this almost certainly understates the total number involved. Nevertheless, at least 2% of any population of women recalled for further tests will have smears, but at agencies that do not submit information to the computer record.

ADJUSTED RATE

The figures presented here indicate the extent to which the original total of 1007 women, apparently due for recall, had been progressively reduced. First, mortality and interim use of the screening service had reduced the number eligible to 850. A further 10% had become ineligible because of a change in their medical status, 5.2% because they had moved out of the region, and 8.9% were temporarily inaccessible. Therefore, 24.1% (205) of

the remaining 850 women did not meet the requirements of the definition of recall set out earlier in this paper, leaving 645 who had had their last test three years earlier, remained eligible and accessible, and were sent letters inviting them to re-attend. Of these, 405 had attended agencies inside the scheme and 19 outside, a total of 424, which gives an adjusted response-rate to recall of 65.7%. This is both a more accurate and more favourable picture of the response, which is very similar to the 64.2% computed by Allman et al. (1974).

The response-rate discussed so far is a proportion of the original population of women who could and did come for a repeat smear when invited by letter three years after their last examination. This is the only reasonable way of determining response, but it is of particular interest to calculate the proportion of women who remained within the screening net, whether by choice or chance, when recall fell due. The Figure illustrates the position diagrammatically.

To the 424 who chose to go for repeat smears inside or outside the scheme when they received a recall letter must be added 150 interim users, a total of 574. Of the women still ostensibly eligible for recall (1007 less 7 dead and 205 ineligible = 795), the 574 who had had one test or more since their first in May 1968 represent 72.2% who continued to participate in the screening programme.

Not all the problems we have identified here will apply equally elsewhere, but we suggest that a similar rate of dilution can be worked out for all
screening programmes, so that a more realistic estimate of the true rate of response to recall can be calculated.

This work was financed by the Department of Health and Social Security.

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doi: 10.1136/jech.29.2.131

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